

# **Technical Guidance and FAQs for the Preparation of Site-specific Non-water Release Corrective Action Plans February 2011**

This technical guidance was developed to assist landfill operators, consultants, and local enforcement agencies in developing sound cost estimates resulting from each reasonably foreseeable causal event for corrective action in the site-specific non-water release Corrective Action Plan (CA Plan). The technical guidance provides recommendations on how to define or characterize each reasonably foreseeable causal event and reflects input from stakeholders and a Technical Advisory Group. CalRecycle staff will monitor the implementation of these recommendations and will communicate with stakeholders when the recommendations need to be amended. The FAQs covering this technical guidance will be updated as questions regarding its implementation are received. If an owner or operation determines that one or more of the recommended reasonably foreseeable causal event are not applicable to their landfill, the owner or operator should meet with the LEA and CalRecycle staff in advance of developing the CA Plan.

## **Background**

CalRecycle adopted regulations, Title 27, California Code of Regulations (CCR), section 22100 et seq., affecting requirements for long-term postclosure maintenance, corrective action, and financial assurances for landfills. The owners and operators of all disposal facilities that were or are required to be permitted as solid waste landfills and have been or will be operated on or after July 1, 1991, are required to provide financial assurance for corrective action based on the highest amount of either the water release corrective action or non-water release corrective action. The regulations allow an owner or operator to determine the value of the non-water release corrective action fund through one of three methods: the CA Plan; the cost for replacement of the final cover; or the closure cost estimate for the landfill. If a landfill owner or operator selects to prepare a CA Plan, the CA Plan must be updated in accordance with the regulations.

The CA Plan is required to provide an assessment of the known or reasonably foreseeable impacts due to causal events and the costs to remediate the known or reasonably foreseeable impacts. Specific causal events identified in the regulations include earthquake, flood, precipitation, tsunami, seiche and fire. In addition to the assessment of the reasonably foreseeable causal events, the CA Plan must also contain the following:

- An evaluation of the long-term performance of the final cover system to ensure that it will continue to meet the requirements of 27 CCR section 21140 without the need for corrective action; and
- Provisions to restore the integrity or establish the adequacy of a damaged or inadequate containment structure or environmental monitoring or control system, to bring a landfill into compliance with the applicable requirements.

## **Applicability**

The desired outcome for the CA Plan is to develop cost estimates based on sound science, engineering, and professional standards of practice to establish financial assurances to ensure that known or

reasonably foreseeable corrective actions at solid waste landfills are accounted for with minimal financial risk to the State. Staff considered the following in development of the recommendations:

- The causal event cannot be the required minimum design standards or siting requirements in Title 27 CCR;
- There is documentation that the causal event has occurred in California;
- The causal event is consistent with current practice and
- Evaluations by other governmental agencies on the likelihood that a causal event would occur in California.

More information on the causal events can be found in the [Background document](#). The background document refers to the recommendations as best management practices, but since the CA Plan is a new requirement; CalRecycle has determined that it is more appropriate to refer to the recommendations as technical guidance is.

The following provides recommendations on the characterization of each reasonably foreseeable causal event as to be used in the CA Plan.

#### Earthquake as the Causal Event<sup>1, 2</sup>

| Not Reasonably Foreseeable  | Deterministic Assessment | Landfill Risk <sup>3</sup> Category | Recommended Return Periods for a Probabilistic Assessment |
|---|--------------------------|-------------------------------------|---|
| MCE* or 2475-yr return period design event; and $\leq 12$ inches permanent deformation. | MCE                      | Low ( $\leq 35$ )                   | 200-year  |
|   | MCE                      | Medium (36-69)                      | 475-year  |
|   | MCE                      | High ( $\geq 70$ )                  | 475 to 950-year   |

\*MCE is the Maximum Credible Earthquake

1. If the landfill is located in a Seismic Hazard Zone, the CA Plan should also evaluate the potential effects of liquefaction; and identify the required corrective action and costs.
2. If the landfill is located within 200 feet of a Holocene fault, the CA Plan should also evaluate for the potential damage from fault ruptures, identify the required corrective action and costs.
3. The landfill risk methodology is contained in Chapter 5 of the 'Study To Identify Potential Long-Term Threats And Financial Assurance Mechanisms For Long-Term Postclosure Maintenance And Corrective Action At Solid Waste Landfills, November 26, 2007'. Alternative methods may be used to determine the landfill risk.  
(<http://www.calrecycle.ca.gov/archive/IWMBMtgDocs/mtgdocs/2007/12/00022762.pdf>)

## Precipitation, Flood, Tsunami and Seiche as the Causal Events

| Causal Event  | Not Reasonably Foreseeable   | Recommended Reasonably Foreseeable Causal Event   |
|---------------|--|---|
| Precipitation | Designed for 1000-year 24-hour storm event   | 1000-year 24-hour storm event   |
| Flood         | The landfill is not located in the 500-year flood zone or the elevation of the landfill is above the depth of the flood event.   | A landfill located within the 500-year flood zone should assess the potential damage resulting from the 500-year flood  |
| Tsunami       | The landfill is not located in an area that is designated to be prone to be inundated by a tsunami by the Department of Conservation or local emergency response agency. | For landfills located in an area that is prone to be inundated by a tsunami, the CA Plan should address the potential impacts and damage that may result                      |
| Seiche        | The landfill is located greater than ½ mile away from a lake or a landlocked bay.  | A landfill located within ½ mile of a lake or landlocked bay should identify the height of the wave and evaluate if the wave will inundate the landfill and cause any damage. |

## Fire as the Causal Event\*

It is recommended:

- 1-that an assumption that 50% of the combustible surface structures within 300 feet of the landfill cell boundaries are destroyed if the landfill is located in a very high fire hazard zone,
- 2- that an assumption that 25% of the combustible surface structures within 200 feet of the landfill cell boundaries are destroyed if the landfill is located in a moderate/medium fire hazard zone
- 3-for landfills not located in the above zones, provide a contingency for replacement of the combustible surface structures within 50 feet of the landfill cell.

\*The CA plan also should address the potential for a subsurface fire; the CA Plan may address the subsurface fire by providing the costs necessary to employ one of the methods to extinguish a subsurface fire (as discussed at CalRecycle's website) or provide a contingency for repair of the cover and landfill gas system.

\*The percentage of structures potentially destroyed and the extent at which the fire spreads should be discounted if there are mitigation measures including engineered systems such as berms or fire breaks; the combustible structures are buried; the presence of on-site personnel trained in fighting fires with

the proper equipment and vehicles; or if there is a routine maintenance plan to remove vegetation and ground debris that would provide fuel to the fire; or if a climatic and/or topographic environment exist that is different than the baseline scenario. Conversely, the extent of combustible structures potentially destroyed should be increased if there is substantial vegetation or ground debris at the landfill interior that would fuel a fire; this situation may be found at a closed landfill that does not have a maintenance plan to control vegetation density.

### CA Plan Preparation

CA Plans are required to be prepared by licensed third-party professionals pursuant to 27 CCR Section 22102(c)

### Frequently Asked Questions

A set of frequently asked questions regarding the CA Plan and its preparation and the responses are provided below:

(Responses to other questions regarding the regulations can found at:

<http://www.calrecycle.ca.gov/lea/Regs/Implement/Postclosure/FAQs.htm#Cost> )

1. In practice the “entity responsible for the design of the solid waste landfill” usually comprises a team of firms, consisting of a primary consultant, subconsultants, and contractors. The “entity” or engineer of record (PE or CEG) that signs off on the JTD/Closure Plan is typically the primary consultant. In this scenario, would the subconsultants and contractors be excluded from being on the third party team?

No. The regulations would only exclude the entity (primary consulting firm) and the engineer of record (PE or CEG).

2. We have had a case where a firm who designed our landfills and is the engineer of record was recently purchased as a subsidiary of another company. Would the parent company be excluded from being a third party preparer despite not being involved in the design work?

No, the regulations would not exclude the parent company from being a third party preparer. The only regulatory restriction related to subsidiary/parental relationships is that associated with the owner/operator (27 CCR Section 22102(c) (1) (D)).

3. Similarly to number 2, a parent company who designed the landfill acquires a firm that was clearly eligible to be a third party preparer prior to the acquisition. Does the firm lose its eligibility status under the new ownership?

This one depends on the meaning of “acquires.”

If the acquired firm remains a separate entity it would not lose its eligibility.

If the acquired firm is subsumed by the “entity responsible for the design of the solid waste landfill” the acquired firm would lose its eligibility.

4. 27 CCR Section 22102 refers to the entity/engineer of record in the JTD/Closure Plan of the most recent SWFP. Throughout the life of a landfill, many different entities/engineers may have played a

role in the design of the landfill and signed off on the JTD. Does the phrase “most recently issued SWFP” mean that previous entities/engineers that are not referenced in the most recently issued SWFP are now eligible third party preparers?

Yes, previous entities/engineers not referenced in the most recently issued SWFP would be eligible.

5. The design engineer of record would be excluded from being a third party preparer. However, that engineer does not work alone. Would an individual from the design team be eligible as third party preparers assuming they left the entity and worked for another firm? Likewise, if the design engineer of record sought opportunities at another firm, could he/she be on the third party team provided this individual did not sign off on the corrective action plan.

Yes to both. An individual from the design team would be eligible as a third party preparer assuming they left the entity and worked for another firm. Likewise, if the design engineer of record sought opportunities at another firm, he/she could be on the third party team provided this individual did not sign off on the corrective action plan.

6. Although 27 CCR Section 22102 explicitly refers to the JTD and Closure Plan, we assume that the entity/engineer of record for third party eligibility determination also extends to the PCMP. Is this correct?

Yes. Although 27 CCR Section 22102 does not explicitly refer to PCM plans it does reference 27 CCR Section 21780, which applies to both closure and PCM plans

7. Should the non-water release Corrective Action Plan address impacts on groundwater or water quality?

AB 1220/Eastin (1993; PRC 43101) established that the State Water Resources Control Board and Regional Water Quality Control Boards (RWQCBs) are the sole agencies with authority to regulate solid waste for the purposes of water quality protection. The CalRecycle non-water release Corrective Action Plan requirements therefore exclude addressing impacts to water quality.

However, the non-water release Corrective Action Plan is required to be submitted to RWQCBs for review. The RWQCBs may conclude that there are potential significant water quality impacts not otherwise addressed in the water-release Corrective Action Plan. The RWQCB may then require revisions to the water-release Plans and related requirements accordingly.

8. What is the timeframe to be addressed as part of the corrective action (what is considered long term)?

The requirements for providing financial assurance for corrective action are in effect during the entire period that the landfill is active and/or subject to postclosure maintenance requirements.

9. How are engineering flaws or failures addressed as part of corrective action?

The regulations require that if an operator chooses to use the non-water release site-specific corrective action plan, the plan must contain an analysis of the containment and environmental monitoring and control systems for adequacy with the applicable standards. If there are engineering flaws or failures that would prevent compliance with the applicable standards, the plan would need to address how the standards would be satisfied either through repair or replacement of the systems. If engineering flaws or failures require corrective action, the funds if needed may be used to remediate the flaws or failures.

10. How does one calculate the change from the MPE to the MCE?

An analysis should be completed to estimate the amount of deformation and ground acceleration based on each event and compare that to the design of the landfill to determine if there will be any damage and, if yes, to what extent. It is not the intent of Technical Guidance to recommend a methodology for this analysis. Methodologies that are standard practice will be considered acceptable.

11. How will the corrective action fund be used if a causal event resulted in both water and non-water corrective action or if the amount in the fund is not sufficient to cover the actual corrective action costs?

In adopting the corrective action financial assurances requirements, CalRecycle considered but did not require financial assurances for both the water release and non-water release Corrective Action Plans. The water release Corrective Action Plan or non-water release Corrective Action Plan cost estimate is required to be funded for the single Plan based on the highest estimate. It is likely that causal event will result in both a water release and non-water release requiring corrective action and that the amount in the fund will not cover fully both water and non-water corrective action. In such cases, CalRecycle and RWQCBs will collaborate, in conjunction with other local, state, and federal agencies to ensure public health and safety and the environment is protected while minimizing the use of public funds. Various potential enforcement and funding strategies are potentially available to CalRecycle and RWQCBs for such purposes and have been used successfully in similar cases.

12. It is our contention that a reasonably foreseeable causal event for precipitation should not be greater than a 200 to 500-year 24-hour storm event, depending on the results of a site-specific hazard analysis.

The 1000-year 24-hour storm event is a design standard for Class 2 landfills, some solid waste landfills are already designed to this standard, and 1000-year 24-hour storm events have occurred in California.

Staff did not find the 200 or 500-year 24-storm event to be commonly used. The recommendations are technical guidance to assist in the preparation of a CA Plan, if an owner or operator determines that one or more of the recommended reasonably foreseeable causal event are not applicable to their landfill, the owner or operator should meet with the LEA and CalRecycle staff in advance of developing the CA Plan.

13. It is proposed that for low-risk areas designated by FEMA that the 100-year flood be used, 200-year flood in undesignated areas, and the 200 to 500-year flood for moderate risk areas, as the reasonably foreseeable causal events.

In researching the FEMA information, the 200-year flood event is not found on the flood maps. As stated in the response to Question 12, owner or operators are encourage to meet with the LEA and CalRecycle staff in advance of developing the CA Plan.

14. It is proposed that up to a 950-year return period as a reasonably foreseeable causal event for some landfills. A reasonably foreseeable return period is between 200 to 475 years. The method for determining the risk category for a landfill has little to do with seismic risk, so alternative methods that are more representative of seismic risk needs to be allowed.

The recommended return period for performing a probabilistic seismic evaluation for a high risk landfill is a range of 475 to 950-year for the return period. If one applies the ICF risk methodology, a landfill would be in high risk category only if the landfill did not meet more than one significant minimum standard.

15. Are there additional challenges to working with the RWQCBs since CalRecycle is no longer part of CalEPA?

The integration of the Integrated Waste Management Board's responsibilities into CalRecycle does not affect the working relationship with the RWQCBs. The provisions of AB 1220 are still in effect, PRC 43101 (c) (11) states that: "Responsibility for establishing and enforcing financial responsibility requirements for solid waste landfills, from operation through to cleanup, shall, to the greatest extent practicable and consistent with applicable federal law, be consolidated into one set of regulations administered by the board, in consultation with the state water board."

16. Should a contingency be used as part of the cost estimates for the non-water corrective action plan, similar to how a contingency is used to determine the closure costs?

The regulations regarding cost estimates for non-water corrective action do not require the use of a contingency. CalRecycle staff would support the use of a contingency in addition to the cost estimates to determine the amount of financial assurance required to address uncertainties such as unforeseen events or needed activities.